MULTIMEDIA UNIVERSITY

STUDENT ID NO

MULTIMEDIA UNIVERSITY

FINAL EXAMINATION

TRIMESTER 3, 2016/2017

BEC 2044 – ECONOMETRICS I

(All sections / Groups)

30 MAY 2017
9.00 a.m – 11.00 p.m
(2 Hours)

INSTRUCTIONS TO STUDENTS

1. This question paper consists of 4 pages with 3 questions only.
2. Attempt **ALL THREE** questions. The distribution of the marks for each question is provided at the end of the questions.
3. Please write all your answer in the Answer Booklet provided.

Question One (40 marks)

(a) Write a **short note** to explain the following econometrics concepts:

i. Least Squares Criterion
ii. Residuals
iii. Durbin-Watson *d*-test
iv. Dummy Variable Trap
v. Misspecification Test

(25 marks)

(b) Match the answer for **Column A** with the one provided in **Column B**. *See example (z).*

	Column A	Answer
z	***BLUE***	*3*
i	White test	
ii	Var- Cov matrix of u	
iii	Second order autoregressive scheme	
iv	Durbin-Watson (*d*) statistics	
v	Variance of each u_i is constant	

	Column B
(1)	Heteroscedasticity errors test
(2)	$u_t = p_1 u_{t-1} + p_2 u_{t-2} + \varepsilon_t$
(3)	***Best Linear Unbiased Estimator***
(4)	$E(uu') = \sigma^2 (X'X)^{-1}$
(5)	Inconclusive region
(6)	$E(u_i^2) = \sigma^2; i = 1,2,\ldots,n$

(15 marks)

Continued...

Question Two (30 marks)

In order to compare the demand for burger during day time and night time, Mr. David estimates the following model for demand for burger over the period 1980-2016 and the results are displayed as per **Exhibit 1**:

$$\log(Demand)_t = \beta_1 + \beta_2 \log(Income)_t + \beta_3 \log(price)_t + \beta_4 D_t + u_t,$$

where log is natural logarithm, Income is consumer income, price is price for burger and D is dummy variable (D=0 for day time; D=1 for night time)

Exhibit 1: Empirical Results based on Ordinary Least Square

	coefficient	***t*-statistic**	***p*-value**
$\hat{\beta}_1$	2.301	1.096	(0.110)
$\hat{\beta}_2$	0.410	2.774	(0.015)
$\hat{\beta}_3$	-0.808	-6.100	(0.005)
$\hat{\beta}_4$	0.113	5.310	(0.007)
F-statistic	99.990		(0.000)
R^2	0.991		
SIC	-1.800		
Diagnostic Tests			
Breusch-Godfrey LM	35.050		(0.182)
White	12.100		(0.300)
Jarque-Bera	0.120		(0.299)
Ramsey's RESET	4.889		(0.120)

At the 5% level of significance:
Critical value – t-distribution for 33 degree of freedom is 2.042
Critical value – F-distribution with 3 and 33 degree of freedom is 2.92

(a) Write down the estimated regression. (5 marks)

(b) Provide an overall interpretation for the above results tabulated in **Exhibit 1**. Your explanations have to be based on economic theories and statistical method(s) for the demand for burger. (15 marks)

(c) Is there any evidence to suggest that consumer prefers to consume more burger at night? Interpret your answer based on **Exhibit 1**. (10 marks)

Continued...

Question Three (30 marks)

Mr. Kim Ji would like to study South Korea's money demand. By using annual data from 1980 to 2016, the following results were obtained:

$$\underset{\substack{(t-statistics)\\[standard\ error]}}{\log \hat{m2}_t} = \underset{\substack{(-1.8784)\\[1.9555]}}{-3.6733} + \underset{\substack{(2.2338)\\[0.2030]}}{0.4534 \log y_t} - \underset{\substack{(-0.4901)\\[0.0048]}}{0.0024\, fd_t} + \underset{\substack{(0.7222)\\[0.0093]}}{0.0067 \inf_t}$$

where
log m2 = broad money, in log
log y = income, in log
fd = financial development
inf = inflation

R^2=0.9962
Durbin-Watson *d* statistic=1.6778

(a) Given significance points of d_L=1.307 and d_U=1.655 at 0.05 level of significance, is there serial correlation in the above equation? Draw your conclusion based on Durbin-Watson *d* test and show your decision rules. (10 marks)

(b) Breusch-Godfrey LM test is widely used to test for higher order autocorrelation. To conduct the test, we may follow the following steps:

First: Estimate the regression model by Ordinary Least Square procedure;
Second: Obtain the least square residuals ($\hat{u}_t$);
Third: Then regress

$$\hat{u}_t = \beta_1 \log y_t + \beta_2 fd_t + \beta_3 \inf_t + p_1\hat{u}_{t-1} + p_2\hat{u}_{t-2} + \ldots + p_p\hat{u}_{t-p} + \varepsilon_t,$$

where $\varepsilon_t \sim N(0, \sigma^2_{\varepsilon_t})$;

Set the null and alternative hypotheses for the test. Provide the remaining steps in testing whether there is higher order autocorrelation. (5 marks)

(c) Discuss any **TWO (2)** causes of model mis-specification in the analysis. (10 marks)

Continued...

(d) Based on the results obtained in **Exhibit 2**, is the model mis-specified? Explain your answer. (5 marks)

Exhibit 2: EViews's Output

Ramsey RESET Test
Equation: UNTITLED
Specification: logm2 logy fd inf C
Omitted Variables: Squares of fitted values

	Value	df	Probability
t-statistic	0.377252	36	0.7082
F-statistic	0.142319	(1, 36)	0.7082
Likelihood ratio	0.161766	1	0.6875

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